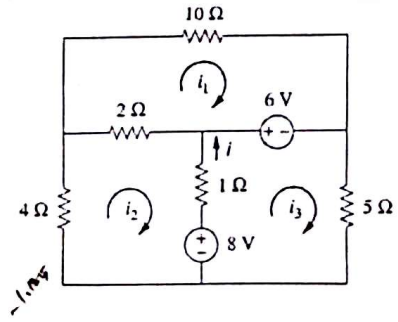
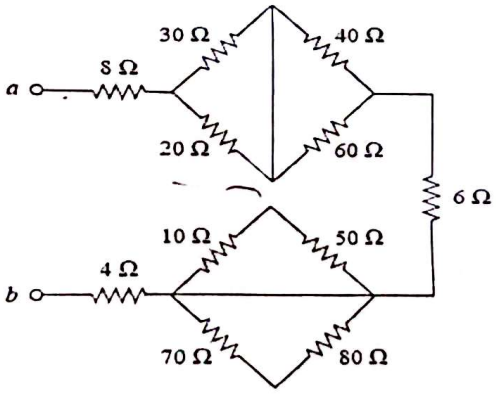
Daffodil International University

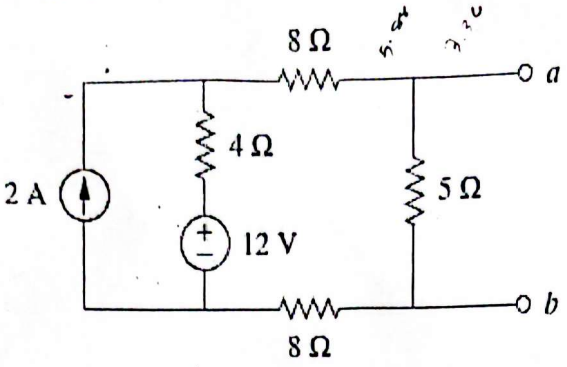
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Midterm Examination, Summer-2025
Course Code: CSE121, Course Title: Electrical Circuits
Level: 1 Term: 3 Batch: 67

Time: 1 Hour and 30 Minutes **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	**Define** the terms 'KVL & KCL.	5×1=5	CO1
	b)	**State** the term 'Superposition Theorem.		
	c)	**Illustrate** the Norton equivalent circuit.		
	d)	**What** do you mean by Current Divider Rule (CDR)?		
	e)	**What** are the factors on which the resistance of a material depends?		
2.	a)	**Solve** the following circuit using mesh analysis to obtain i in the circuit below. 	2×5=10	CO2
	b)	**Solve** the following circuit to determine the equivalent resistance. 		

3.	a)	**Examine** the following circuit to obtain the Thevenin equivalent circuit at terminals a-b.  	2×5=10	CO3
	b)	You are designing a fast-charging phone adapter with a 5V (Vs) output and an internal resistance (Rs) of 0.2 Ω. To achieve **maximum power transfer** for the fastest charging **Analize** the follwing: 1. What should be the **load resistance (RL)** of the smartphone's charging circuit? 2. Calculate the **maximum power (Pmax)** delivered to the phone. 3. If the phone's actual resistance is **0.3 Ω**, is the charger operating at peak efficiency? If not, how can you adjust the design to improve power transfer?		